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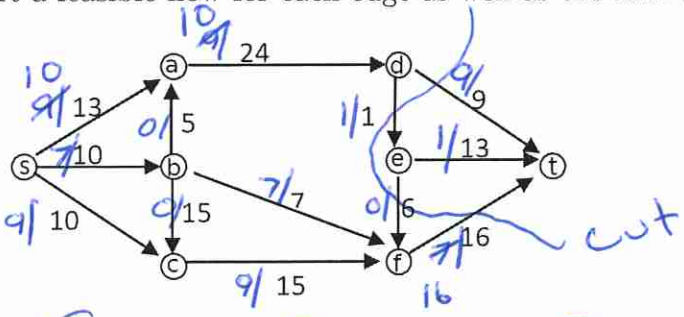
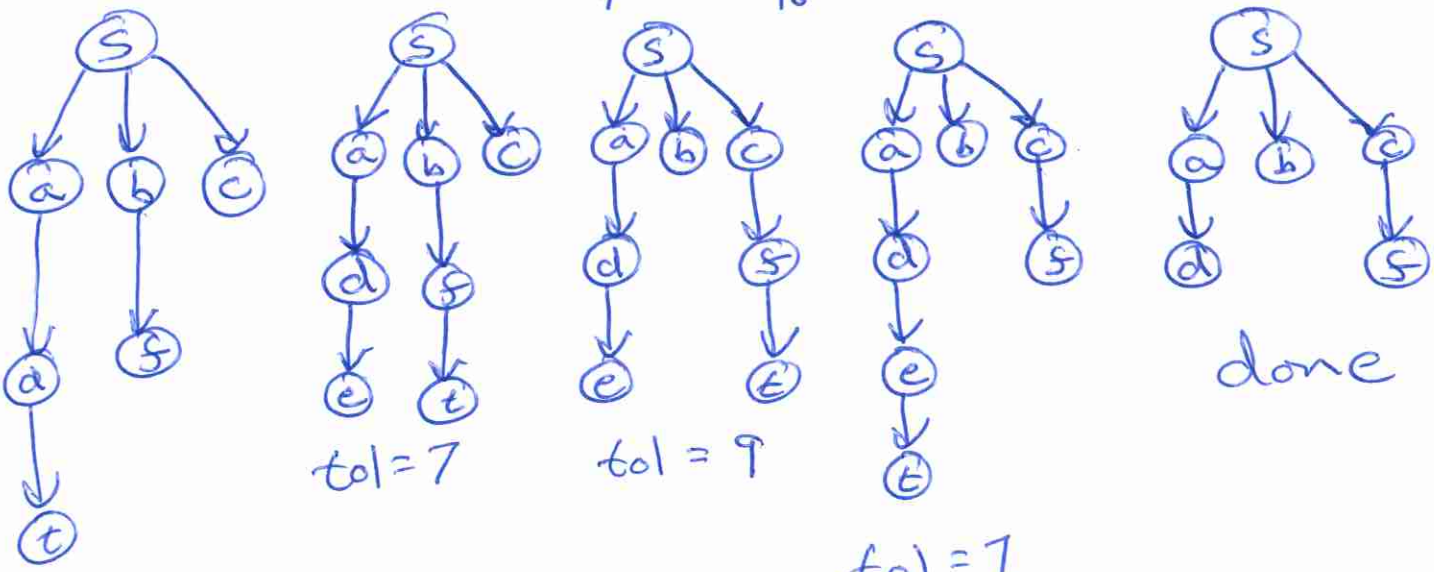
Graph Theory Quiz 3 (7 June 2019)
Open book, open notes, open neighbor.

1. Use Ford-Fulkerson/Edmonds-Karp to find the maximum flow on the below network. Report a feasible flow for each edge as well as the max sum into the sink.





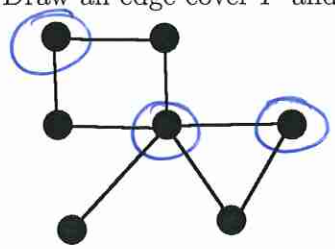
Max flow = 9+7+9+1 = 26

2. What is the size of the minimum cut? Which edges comprise the cut?

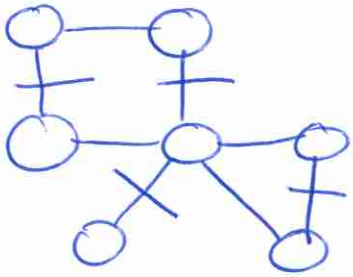
Min cut = max flow = 26

Edges cut = {(d,t), (d,e), (f,t)}

3. Draw an edge cover F and a vertex cover C for the below graph.

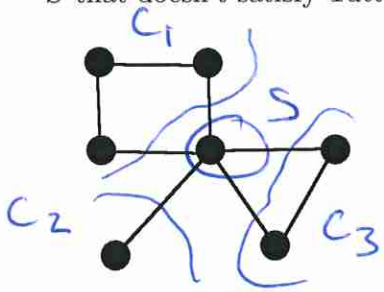


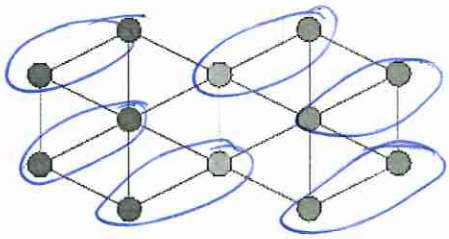
vertex cover
- at least one endpoint $\forall e \in E(G)$ from the cover



edge cover
- all vertices $v \in V(G)$ an endpoint in the cover

4. Either draw a perfect match or prove one doesn't exist by identifying a vertex set S that doesn't satisfy Tutte's Condition for the below graphs.





$|S| = 1$

$o(G-S) = 2$

$|S| < o(G-S)$

$\Rightarrow$ no perfect match

$\Rightarrow$ perfect match